

SEQUENCE LISTING

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Sarkis Mazmanian
Gwen Liu
Hung Ton-That

<120> IDENTIFICATION OF SORTASE GENE

<130> 510015.213

<160> 36

<170> FastSEQ for Windows Version 3.0

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<212> PRT
<213> Bacteria

<400> 1
Leu Pro Xaa Thr Gly
1 5

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<212> DNA
<213> Staphylococcus aureus

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atc cta gtg gca gca tat ttg ttt gct aaa cca cat atc gat aat tat 96
Ile Leu Val Ala Ala Tyr Leu Phe Ala Lys Pro His Ile Asp Asn Tyr
20 25 30

ctt cac gat aaa gat aaa gat gaa aag att gaa caa tat gat aaa aat 144
Leu His Asp Lys Asp Lys Asp Glu Lys Ile Glu Gln Tyr Asp Lys Asn
35 40 45

gta aaa gaa cag gcg agt aaa gat aaa aag cag caa gct aaa cct caa 192
Val Lys Glu Gln Ala Ser Lys Asp Lys Lys Gln Gln Ala Lys Pro Gln
50 55 60

att ccg aaa gat aaa tcg aaa gtg gca ggc tat att gaa att cca gat 240

Ile Pro Lys Asp Lys Ser Lys Val Ala Gly Tyr Ile Glu Ile Pro Asp				
65	70	75	80	
gct gat att aaa gaa cca gta tat cca gga cca gca aca cct gaa caa				288
Ala Asp Ile Lys Glu Pro Val Tyr Pro Gly Pro Ala Thr Pro Glu Gln				
85	90	95		
tta aat aga ggt gta agc ttt gca gaa gaa aat gaa tca cta gat gat				336
Leu Asn Arg Gly Val Ser Phe Ala Glu Asn Glu Ser Leu Asp Asp				
100	105	110		
caa aat att tca att gca gga cac act ttc att gac cgt ccg aac tat				384
Gln Asn Ile Ser Ile Ala Gly His Thr Phe Ile Asp Arg Pro Asn Tyr				
115	120	125		
caa ttt aca aat ctt aaa gca gcc aaa aaa ggt agt atg gtg tac ttt				432
Gln Phe Thr Asn Leu Lys Ala Ala Lys Lys Gly Ser Met Val Tyr Phe				
130	135	140		
aaa gtt ggt aat gaa aca cgt aag tat aaa atg aca agt ata aga gat				480
Lys Val Gly Asn Glu Thr Arg Lys Tyr Lys Met Thr Ser Ile Arg Asp				
145	150	155	160	
gtt aag cct aca gat gta gga gtt cta gat gaa caa aaa ggt aaa gat				528
Val Lys Pro Thr Asp Val Gly Val Leu Asp Glu Gln Lys Gly Lys Asp				
165	170	175		
aaa caa tta aca tta att act tgt gat gat tac aat gaa aag aca ggc				576
Lys Gln Leu Thr Leu Ile Thr Cys Asp Asp Tyr Asn Glu Lys Thr Gly				
180	185	190		
gtt tgg gaa aaa cgt aaa atc ttt gta gct aca gaa gtc aaa taa				621
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<213> Staphylococcus aureus				
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20	25	30		
Leu His Asp Lys Asp Lys Asp Glu Lys Ile Glu Gln Tyr Asp Lys Asn				
35	40	45		
Val Lys Glu Gln Ala Ser Lys Asp Lys Lys Gln Gln Ala Lys Pro Gln				
50	55	60		
Ile Pro Lys Asp Lys Ser Lys Val Ala Gly Tyr Ile Glu Ile Pro Asp				
65	70	75	80	
Ala Asp Ile Lys Glu Pro Val Tyr Pro Gly Pro Ala Thr Pro Glu Gln				

	85	90	95
Leu Asn Arg Gly Val Ser Phe Ala Glu	Glu Asn Glu Ser	Leu Asp Asp	
100	105	110	
Gln Asn Ile Ser Ile Ala Gly His	Thr Phe Ile Asp	Arg Pro Asn Tyr	
115	120	125	
Gln Phe Thr Asn Leu Lys Ala Ala	Lys Gly Ser	Met Val Tyr Phe	
130	135	140	
Lys Val Gly Asn Glu Thr Arg Lys	Tyr Lys Met	Thr Ser Ile Arg Asp	
145	150	155	160
Val Lys Pro Thr Asp Val Gly Val	Leu Asp Glu Gln	Lys Gly Lys Asp	
165	170	175	
Lys Gln Leu Thr Leu Ile Thr Cys	Asp Asp Tyr Asn Glu	Lys Thr Gly	
180	185	190	
Val Trp Glu Lys Arg Lys Ile Phe	Val Ala Thr Glu Val	Lys	
195	200	205	

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<211> 227

<212> PRT

<213> Streptococcus pyogenes

<400> 4

Met	Glu Glu Val Trp Gln Lys Ala Lys	Ala Tyr Asn Ala Arg	Leu Gly	
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Thr	Gln Pro Val Pro Asp Ala Phe	Ser Phe Arg Asp Gly	Ile His Asp	
	20	25	30	
Lys	Asn Tyr Glu Ser Leu Leu Gln	Ile Glu Asn Asn Asp	Ile Met Gly	
	35	40	45	
Tyr	Val Glu Val Pro Ser Ile Lys	Val Thr Leu Pro Ile Tyr	His Tyr	
	50	55	60	
Thr	Thr Asp Glu Val Leu Thr Lys	Gly Ala Gly His Leu Phe	Gly Ser	
	65	70	75	80
Ala	Leu Pro Val Gly Gly Asp Gly	Thr His Thr Val Ile Ser	Ala His	
	85	90	95	
Arg	Gly Leu Pro Ser Ala Glu Met	Phe Thr Asn Leu Asn	Leu Val Lys	
	100	105	110	
Lys	Gly Asp Thr Phe Tyr Phe	Arg Val Leu Asn Lys	Val Ala Tyr	
	115	120	125	
Lys	Val Asp Gln Ile Leu Thr Val	Glu Pro Asp Gln Val	Thr Ser Leu	
	130	135	140	
Ser	Gly Val Met Gly Lys Asp	Tyr Ala Thr Leu Val	Thr Cys Thr Pro	
	145	150	155	160
Tyr	Gly Val Asn Thr Lys Arg	Leu Leu Val Arg	Gly His Arg	
	165	170	175	
Tyr	His Tyr Lys Lys Tyr Gln	Gln Ala Lys Lys	Ala Met Lys	
	180	185	190	
Asp	Lys Ser Arg Met Trp Ala Glu	Val Val Cys Ala	Ala Phe Gly Val	
	195	200	205	
Val	Ile Ala Ile Ile Leu Val Phe	Met Tyr Ser Arg	Val Ser Ala Lys	
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Lys	Ser Lys			
	225			

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<213> *Actinomyces naeslundii*

<400> 5

Met	Gly	Leu	Leu	Thr	Tyr	Pro	Thr	Ala	Ala	Ser	Trp	Val	Ser	Gln	Tyr
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Asn	Gln	Ser	Lys	Val	Thr	Ala	Asp	Tyr	Ser	Ala	Gln	Val	Asp	Gly	Ala
			20				25						30		
Arg	Pro	Asp	Ala	Lys	Thr	Gln	Val	Glu	Gln	Ala	His	Ala	Tyr	Asn	Asp
				35			40				45				
Ala	Leu	Ser	Ala	Gly	Ala	Val	Leu	Glu	Ala	Asn	Asn	His	Val	Pro	Thr
				50			55			60					
Gly	Ala	Gly	Ser	Ser	Lys	Asp	Ser	Ser	Leu	Gln	Tyr	Ala	Asn	Ile	Leu
				65			70			75			80		
Lys	Ala	Asn	Asn	Glu	Gly	Leu	Met	Ala	Arg	Leu	Lys	Ile	Pro	Ser	Ile
				85				90			95				
Ser	Leu	Asp	Leu	Pro	Val	Tyr	His	Gly	Thr	Ala	Asp	Asp	Thr	Leu	Leu
				100				105			110				
Lys	Gly	Leu	Gly	His	Leu	Glu	Gly	Thr	Ser	Leu	Pro	Val	Gly	Gly	Glu
				115			120			125					
Gly	Thr	Arg	Ser	Val	Ile	Thr	Gly	His	Arg	Gly	Leu	Ala	Glu	Ala	Thr
				130			135			140					
Met	Phe	Thr	Asn	Leu	Asp	Lys	Val	Lys	Thr	Gly	Asp	Ser	Leu	Ile	Val
				145			150			155			160		
Gly	Val	Phe	Gly	Glu	Val	Leu	Thr	Tyr	Arg	Val	Thr	Ser	Thr	Lys	Val
					165			170			175				
Val	Glu	Pro	Glu	Glu	Thr	Glu	Ala	Leu	Arg	Val	Glu	Glu	Gly	Lys	Asp
				180				185			190				
Leu	Leu	Thr	Leu	Val	Thr	Cys	Thr	Pro	Leu	Gly	Ile	Asn	Thr	His	Arg
				195				200			205				
Ile	Leu	Leu	Thr	Gly	Glu	Arg	Ile	Tyr	Pro	Thr	Pro	Ala	Lys	Asp	Leu
				210			215			220					
Ala	Ala	Ala	Gly	Lys	Arg	Pro	Asp	Val	Pro	His	Phe	Pro	Trp	Trp	Ala
				225			230			235			240		
Val	Gly	Leu	Ala	Ala	Gly	Leu	Ile	Val	Val	Gly	Leu	Tyr	Leu	Trp	Arg
					245				250			255			
Ser	Gly	Tyr	Ala	Ala	Ala	Arg	Ala	Lys	Glu	Arg	Ala	Leu	Ala	Arg	Ala
					260			265			270				
Arg	Ala	Ala	Gln	Glu	Glu	Pro	Gln	Pro	Gln	Thr	Trp	Ala	Glu	Gln	Met
				275			280			285					
Arg	Ile	Trp	Met	Asp	Asp	Asp	Ala	Gly	Val	Glu	Pro	Gln	Arg	Trp	Phe
				290			295			300					
Thr	Asp	Leu	Pro	Val	Pro	Pro	Gln	Pro	Ser	Glu	Met	Glu	Asn	Leu	Ala
				305			310			315			320		
Leu	Leu	Glu	Glu	Ile	Ala	Ser	Leu	Ser	Ala	Pro	Ser	Gly	Arg	Trp	Asp
					325			330			335				
Asp	Gln	Glu	Leu	Ile	Asp	Thr	Ala	Glu	Ile	Pro	Val	Leu	Asp	Ala	Thr
					340			345			350				
Arg	Pro	Ser	Ala	Gly	Thr	Ser	Gly	Arg	Thr	His	Arg	Leu			
				355			360			365					

<210> 6
<211> 284
<212> PRT
<213> Enterococcus faecalis

<400> 6

Met	Lys	Ser	Lys	Lys	Arg	Arg	Ile	Ile	Asp	Gly	Phe	Met	Ile	Leu	
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Leu	Leu	Ile	Ile	Gly	Ile	Gly	Ala	Phe	Ala	Tyr	Pro	Phe	Val	Ser	Asp
				20				25					30		
Ala	Leu	Asn	Asn	Tyr	Leu	Asp	Gln	Gln	Ile	Ile	Ala	His	Tyr	Gln	Ala
				35			40				45				
Lys	Ala	Ser	Gln	Glu	Asn	Thr	Lys	Glu	Met	Ala	Glu	Leu	Gln	Glu	Lys
				50			55			60					
Met	Glu	Lys	Lys	Asn	Gln	Glu	Leu	Ala	Lys	Lys	Gly	Ser	Asn	Pro	Gly
	65				70				75				80		
Leu	Asp	Pro	Phe	Ser	Glu	Thr	Gln	Lys	Thr	Thr	Lys	Lys	Pro	Asp	Lys
				85			90			95					
Ser	Tyr	Phe	Glu	Ser	His	Thr	Ile	Gly	Val	Leu	Thr	Ile	Pro	Lys	Ile
				100			105			110					
Asn	Val	Arg	Leu	Pro	Ile	Phe	Asp	Lys	Thr	Asn	Ala	Leu	Leu	Glu	
				115			120			125					
Lys	Gly	Ser	Ser	Leu	Leu	Glu	Gly	Thr	Ser	Tyr	Pro	Thr	Gly	Gly	Thr
				130			135			140					
Asn	Thr	His	Ala	Val	Ile	Ser	Gly	His	Arg	Gly	Leu	Pro	Gln	Ala	Lys
	145				150				155				160		
Leu	Phe	Thr	Asp	Leu	Pro	Glu	Leu	Lys	Lys	Gly	Asp	Glu	Phe	Tyr	Ile
				165			170			175					
Glu	Val	Asn	Gly	Lys	Thr	Leu	Ala	Tyr	Gln	Val	Asp	Gln	Ile	Lys	Thr
				180			185			190					
Val	Glu	Pro	Thr	Asp	Thr	Lys	Asp	Leu	His	Ile	Glu	Ser	Gly	Gln	Asp
				195			200			205					
Leu	Val	Thr	Leu	Leu	Thr	Cys	Thr	Pro	Tyr	Met	Ile	Asn	Ser	His	Arg
				210			215			220					
Leu	Leu	Val	Arg	Gly	His	Arg	Ile	Pro	Tyr	Gln	Pro	Glu	Lys	Ala	Ala
				225			230			235			240		
Ala	Gly	Met	Lys	Lys	Val	Ala	Gln	Gln	Gln	Asn	Leu	Leu	Leu	Trp	Thr
					245			250			255				
Leu	Leu	Leu	Ile	Ala	Cys	Ala	Leu	Ile	Ile	Ser	Gly	Phe	Ile	Ile	Trp
				260			265			270					
Tyr	Lys	Arg	Arg	Lys	Lys	Thr	Thr	Arg	Lys	Pro	Lys				
				275			280								

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<213> Streptococcus mutans

<400> 7

Met	Lys	Lys	Glu	Arg	Gln	Ser	Arg	Lys	Lys	Arg	Ser	Phe	Leu	Arg	Thr
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Phe	Leu	Pro	Ile	Leu	Leu	Leu	Val	Ile	Gly	Leu	Ala	Leu	Ile	Phe	Asn
				20			25			30					

Thr Pro Ile Arg Asn Ala Leu Ile Ala Trp Asn Thr Asn Arg Tyr Gln
 35 40 45
 Val Ser Asn Val Ser Lys Lys Asp Ile Glu His Asn Lys Ala Ala His
 50 55 60
 Ser Ser Phe Asp Phe Lys Lys Val Glu Ser Ile Ser Thr Gln Ser Val
 65 70 75 80
 Leu Ala Ala Gln Met Ala Ala Gln Lys Leu Pro Val Ile Gly Gly Ile
 85 90 95
 Ala Ile Pro Asp Leu Lys Ile Asn Leu Pro Ile Phe Lys Gly Leu Asp
 100 105 110
 Asn Val Gly Leu Thr Tyr Gly Ala Gly Thr Met Lys Asn Asp Gln Val
 115 120 125
 Met Gly Glu Asn Asn Tyr Ala Leu Ala Ser His His Val Phe Gly Met
 130 135 140
 Thr Gly Ser Ser Gln Met Leu Phe Ser Pro Leu Glu Arg Ala Lys Glu
 145 150 155 160
 Gly Met Glu Ile Tyr Leu Thr Asp Lys Asn Lys Val Tyr Thr Tyr Val
 165 170 175
 Ile Ser Glu Val Lys Thr Val Thr Pro Glu His Val Glu Val Ile Asp
 180 185 190
 Asn Arg Pro Gly Gln Asn Glu Val Thr Leu Val Thr Cys Thr Asp Ala
 195 200 205
 Gly Ala Thr Ala Arg Thr Ile Val His Gly Thr Tyr Lys Gly Glu Asn
 210 215 220
 Asp Phe Asn Lys Thr Ser Lys Lys Ile Lys Lys Ala Phe Arg Gln Ser
 225 230 235 240
 Tyr Asn Gln Ile Ser Phe
 245

<210> 8

<211> 198

<212> PRT

<213> Bacillus subtilis

<400> 8

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 20 25 30
 Gln Thr Leu Lys Glu Ala Lys Leu Ala Ala Lys Lys Pro Gln Glu Ala
 35 40 45
 Ser Gly Thr Lys Asn Ser Thr Asp Gln Ala Lys Asn Lys Ala Ser Phe
 50 55 60
 Lys Pro Glu Thr Gly Gln Ala Ser Gly Ile Leu Glu Ile Pro Lys Ile
 65 70 75 80
 Asn Ala Glu Leu Pro Ile Val Glu Gly Thr Asp Ala Asp Asp Leu Glu
 85 90 95
 Lys Gly Val Gly His Tyr Lys Asp Ser Tyr Tyr Pro Asp Glu Asn Gly
 100 105 110
 Gln Ile Val Leu Ser Gly His Arg Asp Thr Val Phe Arg Arg Thr Gly
 115 120 125
 Glu Leu Glu Lys Gly Asp Gln Leu Arg Leu Leu Ser Tyr Gly Glu
 130 135 140

Phe Thr Tyr Glu Ile Val Lys Thr Lys Ile Val Asp Lys Asp Asp Thr
145 150 155 160
Ser Ile Ile Thr Leu Gln His Glu Lys Glu Glu Leu Ile Leu Thr Thr
165 170 175
Cys Tyr Pro Phe Ser Tyr Val Gly Asn Ala Pro Lys Arg Tyr Ile Ile
180 185 190
Tyr Gly Lys Arg Val Thr
195

<210> 9
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<212> PRT
<213> Staphylococcus aureus

<400> 9
Glu Glu Asn Pro Phe Ile Gly Thr Thr Val Phe Gly Gly Leu Ser Leu
1 5 10 15
Ala Leu Gly Ala Ala Leu Leu Ala Gly
20 25

<210> 10
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<213> Staphylococcus aureus

<400> 10
Gly Glu Glu Ser Thr Asn Lys Gly Met Leu Phe Gly Gly Leu Phe Ser
1 5 10 15
Ile Leu Gly Leu Ala Leu Leu
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<213> Staphylococcus sobrinus

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Asp Ser Ser Asn Ala Tyr Leu Pro Leu Leu Gly Leu Val Ser Leu Thr
1 5 10 15
Ala Gly Phe Ser Leu Leu Gly Leu
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<213> Enterococcus faecalis

<400> 12
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1 5 10 15
Leu Gly Leu Ala Gly Leu Gly Phe
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<210> 13
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<213> Streptococcus pyogenes

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Ser Ile Gly Thr Tyr Leu Phe Lys Ile Gly Ser Ala Ala Met Ile Gly
1 5 10 15
Ala Ile Gly Ile Tyr Ile Val
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<210> 14
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<212> PRT
<213> Listeria monocytogenes

<400> 14
Asp Ser Asp Asn Ala Leu Tyr Leu Leu Leu Gly Leu Leu Ala Val Gly
1 5 10 15
Thr Ala Met Ala Leu Thr
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<400> 15
Arg Arg Arg Glu Leu
1 5

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<213> Staphylococcus aureus

<400> 16
Arg Arg Asn Lys Lys Asn His Lys Ala
1 5

<210> 17
<211> 5
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<213> Staphylococcus sobrinus

<400> 17
Arg Arg Lys Gln Asp
1 5

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<213> Enterococcus faecalis

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Lys Arg Arg Lys Glu Thr Lys
1 5

<210> 19

<211> 5

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<213> Streptococcus pyogenes

<400> 19

Lys Arg Arg Lys Ala
1 5

<210> 20

<211> 8

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<213> Actinomyces viscosus

<400> 20

Lys Arg Arg His Val Ala Lys His
1 5

<210> 21

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<213> Streptococcus aglactiae

<400> 21

Lys Arg Arg Lys Ser
1 5

<210> 22

<211> 6

<212> PRT

<213> Streptococcus pyogenes

<400> 22

Lys Arg Lys Glu Glu Asn
1 5

<210> 23

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<212> PRT

<213> Mutated derived from streptococcus pyogenes

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Arg Arg Arg Glu Ser
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<210> 24

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<213> Mutated derived from streptococcus pyogenes

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Arg Arg Arg Ser Leu
1 5

<210> 25

<211> 5

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Arg Arg Ser Glu Leu
1 5

<210> 26

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<213> Mutated derived from streptococcus pyogenes

<400> 26

Arg Ser Arg Glu Leu
1 5

<210> 27

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<212> PRT

<213> Mutated derived from streptococcus pyogenes

<400> 27

Ser Arg Arg Glu Leu
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<212> PRT

<213> Mutated derived from streptococcus pyogenes

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Arg Arg Ser Ser Ser
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Arg Ser Arg Ser Ser
1 5

<210> 30

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<213> Mutated derived from streptococcus pyogenes

<400> 30

Ser Arg Arg Ser Ser
1 5

<210> 31

<211> 19

<212> PRT

<213> Mutated derived from streptococcus pyogenes

<400> 31

His His His His His Ala Gln Ala Leu Glu Pro Thr Gly Glu Glu
1 5 10 15
Asn Pro Phe

<210> 32

<211> 29

<212> DNA

<213> Staphylococcus aureus

<400> 32

aaggattcaa aaggagcggt atacattgc

29

<210> 33

<211> 29

<212> DNA

<213> Staphylococcus aureus

<400> 33

aaggatcccta cctttccctc tagctgaac

29

<210> 34

<211> 283

<212> PRT

<213> Streptococcus pneumoniae srtA

<400> 34

Met Ser Arg Thr Lys Leu Arg Ala Leu Leu Gly Tyr Leu Leu Met Leu
1 5 10 15

Val Ala Cys Leu Ile Pro Ile Tyr Cys Phe Gly Gln Met Val Leu Gln
20 25 30

Ser Leu Gly Gln Val Lys Gly His Ala Thr Phe Val Lys Ser Met Thr
35 40 45

Thr Glu Met Tyr Gln Glu Gln Gln Asn His Ser Leu Ala Tyr Asn Gln
50 55 60

Arg Leu Ala Ser Gln Asn Arg Ile Val Asp Pro Phe Leu Ala Glu Gly
65 70 75 80

Tyr Glu Val Asn Tyr Gln Val Ser Asp Asp Pro Asp Ala Val Tyr Gly
85 90 95

Tyr Leu Ser Ile Pro Ser Leu Glu Ile Met Glu Pro Val Tyr Leu Gly

	100		105		110										
Ala	Asp	Tyr	His	His	Leu	Gly	Met	Gly	Leu	Ala	His	Val	Asp	Gly	Thr
							115		120				125		
Pro	Leu	Pro	Leu	Asp	Gly	Thr	Gly	Ile	Arg	Ser	Val	Ile	Ala	Gly	His
							130		135			140			
Arg	Ala	Glu	Pro	Ser	His	Val	Phe	Phe	Arg	His	Leu	Asp	Gln	Leu	Lys
							145		150		155		160		
Val	Gly	Asp	Ala	Leu	Tyr	Tyr	Asp	Asn	Gly	Gln	Glu	Ile	Val	Glu	Tyr
							165		170		175				
Gln	Met	Met	Asp	Thr	Glu	Ile	Ile	Leu	Pro	Ser	Glu	Trp	Glu	Lys	Leu
							180		185		190				
Glu	Ser	Val	Ser	Ser	Lys	Asn	Ile	Met	Thr	Leu	Ile	Thr	Cys	Asp	Pro
							195		200		205				
Ile	Pro	Thr	Phe	Asn	Lys	Arg	Leu	Leu	Val	Asn	Phe	Glu	Arg	Val	Ala
							210		215		220				
Val	Tyr	Gln	Lys	Ser	Asp	Pro	Gln	Thr	Ala	Ala	Val	Ala	Arg	Val	Ala
							225		230		235		240		
Phe	Thr	Lys	Glu	Gly	Gln	Ser	Val	Ser	Arg	Val	Ala	Thr	Ser	Gln	Trp
							245		250		255				
Leu	Tyr	Arg	Gly	Leu	Val	Val	Leu	Ala	Phe	Leu	Gly	Ile	Leu	Phe	Val
							260		265		270				
Leu	Trp	Lys	Leu	Ala	Arg	Leu	Leu	Arg	Gly	Lys					
							275		280						

<210> 35

<211> 296

<212> PRT

<213> Streptococcus pneumoniae srtB

<400> 35

Met	Asp	Asn	Ser	Arg	Arg	Ser	Arg	Lys	Lys	Gly	Thr	Lys	Lys	Lys	Lys
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His	Pro	Leu	Ile	Leu	Leu	Ile	Phe	Leu	Val	Gly	Phe	Ala	Val	Ala	
								20	25	30					
Ile	Tyr	Pro	Leu	Val	Ser	Arg	Tyr	Tyr	Tyr	Arg	Ile	Ser	Asn	Glu	Val
							35	40	45						
Ile	Lys	Glu	Phe	Asp	Glu	Thr	Val	Ser	Gln	Met	Asp	Lys	Ala	Glu	Leu
							50	55	60						
Glu	Glu	Arg	Trp	Arg	Leu	Ala	Gln	Ala	Phe	Asn	Ala	Thr	Leu	Lys	Pro
							65	70	75			80			
Ser	Glu	Ile	Leu	Asp	Pro	Phe	Thr	Glu	Gln	Glu	Lys	Lys	Gly	Val	
							85	90	95						
Ser	Glu	Tyr	Ala	Asn	Met	Leu	Lys	Val	His	Glu	Arg	Ile	Gly	Tyr	Val
							100	105	110						
Glu	Ile	Pro	Ala	Ile	Asp	Gln	Glu	Ile	Pro	Met	Tyr	Val	Gly	Thr	Ser
							115	120	125						
Glu	Asp	Ile	Leu	Gln	Lys	Gly	Ala	Gly	Leu	Leu	Glu	Gly	Ala	Ser	Leu
							130	135	140						
Pro	Val	Gly	Gly	Glu	Asn	Thr	His	Thr	Val	Ile	Thr	Ala	His	Arg	Gly
							145	150	155			160			
Leu	Pro	Thr	Ala	Glu	Leu	Phe	Ser	Gln	Leu	Asp	Lys	Met	Lys	Lys	Gly
							165	170	175						
Asp	Ile	Phe	Tyr	Leu	His	Val	Leu	Asp	Gln	Val	Leu	Ala	Tyr	Gln	Val

180	185	190
Asp Gln Ile Val Thr Val Glu Pro Asn Asp Phe Glu Pro Val	Leu Ile	
195	200	205
Gln His Gly Glu Asp Tyr Ala Thr Leu Leu Thr Cys Thr Pro	Tyr Met	
210	215	220
Ile Asn Ser His Arg Leu Leu Val Arg Gly Lys Arg Ile Pro	Tyr Thr	
225	230	235
Ala Pro Ile Ala Glu Arg Asn Arg Ala Val Arg Glu Arg Gly	Gln Phe	
245	250	255
Trp Leu Trp Leu Leu Gly Ala Met Ala Val Ile Leu Leu Leu		
260	265	270
Tyr Arg Val Tyr Arg Asn Arg Arg Ile Val Lys Gly Leu Glu	Lys Gln	
275	280	285
Leu Glu Gly Arg His Val Lys Asp		
290	295	

<210> 36
 <211> 304
 <212> PRT
 <213> Streptococcus pneumoniae srtC

<400> 36		
Met Leu Ile Lys Met Val Lys Thr Lys Lys Gln Lys Arg Asn Asn	Leu	
15	10	15
Leu Leu Gly Val Val Phe Phe Ile Gly Met Ala Val Met Ala Tyr	Pro	
20	25	30
Leu Val Ser Arg Leu Tyr Tyr Arg Val Glu Ser Asn Gln Gln Ile	Ala	
35	40	45
Asp Phe Asp Lys Glu Lys Ala Thr Leu Asp Glu Ala Asp Ile Asp	Glu	
50	55	60
Arg Met Lys Leu Ala Gln Ala Phe Asn Asp Ser Leu Asn Asn Val	Val	
65	70	75
Arg Glu Asp Pro Trp Ser Glu Glu Met Lys Lys Lys Gly Arg Ala	Glu	
85	90	95
Tyr Ala Arg Met Leu Glu Ile His Glu Arg Met Gly His Val Glu	Ile	
100	105	110
Pro Val Ile Asp Val Asp Leu Pro Val Tyr Ala Gly Thr Ala Glu	Glu	
115	120	125
Val Leu Gln Gln Gly Ala Gly His Leu Glu Gly Thr Ser Leu Pro	Ile	
130	135	140
Gly Gly Asn Ser Thr His Ala Val Ile Thr Ala His Thr Gly Leu	Pro	
145	150	155
Thr Ala Lys Met Phe Thr Asp Leu Thr Lys Leu Lys Val Gly Asp	Lys	
165	170	175
Phe Tyr Val His Asn Ile Lys Glu Val Met Ala Tyr Gln Val Asp	Gln	
180	185	190
Val Lys Val Ile Glu Pro Thr Asn Phe Asp Asp Leu Leu Ile Val	Pro	
195	200	205
Gly His Asp Tyr Val Thr Leu Leu Thr Cys Thr Pro Tyr Met Ile	Asn	
210	215	220
Thr His Arg Leu Leu Val Arg Gly His Arg Ile Pro Tyr Val Ala	Glu	
225	230	235
Val Glu Glu Glu Phe Ile Ala Ala Asn Lys Leu Ser His Leu Tyr	Arg	

245 250 255
Tyr Leu Phe Tyr Val Ala Val Gly Leu Ile Val Ile Leu Leu Trp Ile
260 265 270
Ile Arg Arg Leu Arg Lys Lys Lys Gln Pro Glu Lys Ala Leu Lys
275 280 285
Ala Leu Lys Ala Ala Arg Lys Glu Val Lys Val Glu Asp Gly Gln Gln
290 295 300